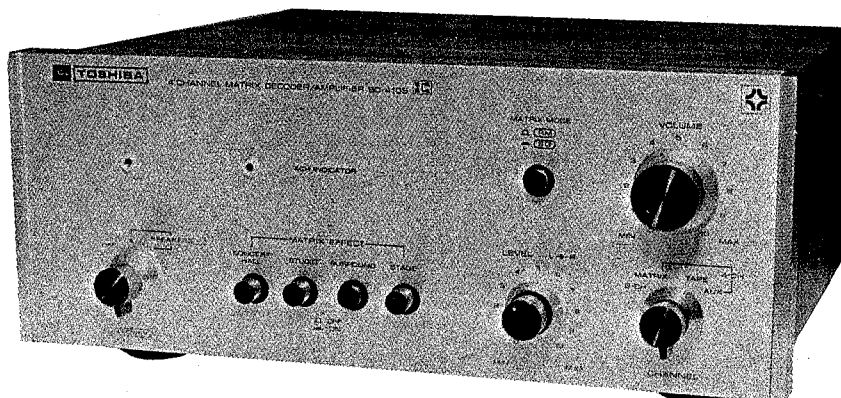




TOSHIBA SOLIDSTATE MATRIX DECODER/ AMPLIFIER

SERVICE DATA MODEL SC-410S

File No. 140-053



SPECIFICATIONS

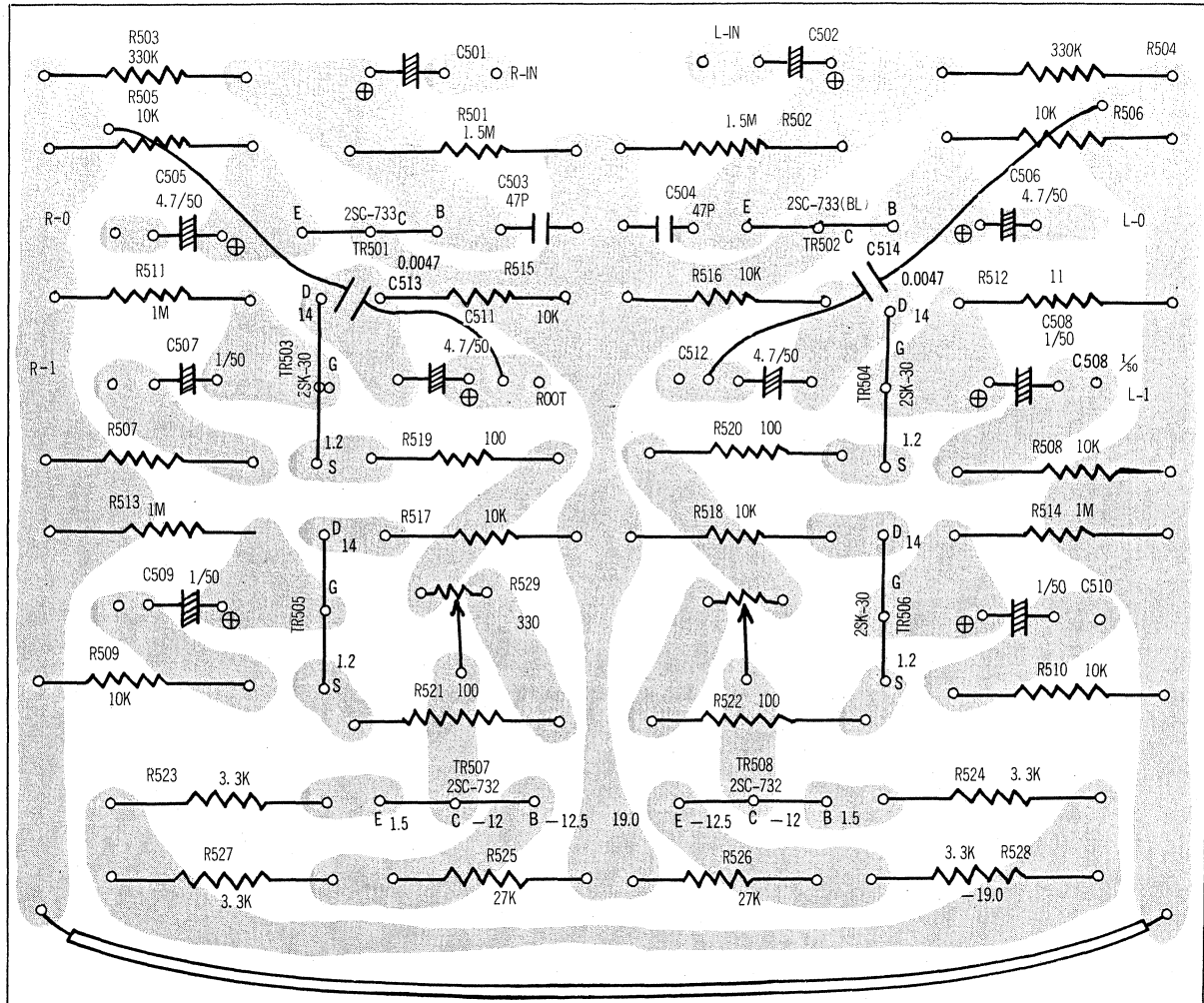
(1) Amplifier			
Semiconductors	2 IC, 15 Transistors (4 FET) 1 Diod		
Output Power	40 Watts (8 ohm) Total IHF music power		
	20 Watts (16 ohm) (0.8% Distortion)		
	30 Watts (8 ohm) Total r.m.s. continuous		
	18 Watts (16 ohm) power		
Harmonic Distortion	0.8% at rated power output		
	0.2% at 1W/1W power output		
Input Sensitivity	Input	30, 150, 500mV	(50Kohm)
	TAPE	300mV	(100Kohm)
	AUX	300mV	(100Kohm)
Recording output (for 2 channel)	150mV		
Optimum speaker impeadance	8, 16 ohm		
Power source	100/120/220/240 V 50/60 Hz		
Power consumption	55 W		
(2) General			
Dimensions	net	12 $\frac{1}{4}$ (W) 12(D) 4 $\frac{3}{4}$ (H)	(inch)
	gross	16(W) 16(D) 8(H)	(inch)
Weight	net	2.0 (LBS)	
	gross	2 $\frac{3}{4}$ (LBS)	

TOKYO SHIBAURA ELECTRIC CO., LTD.

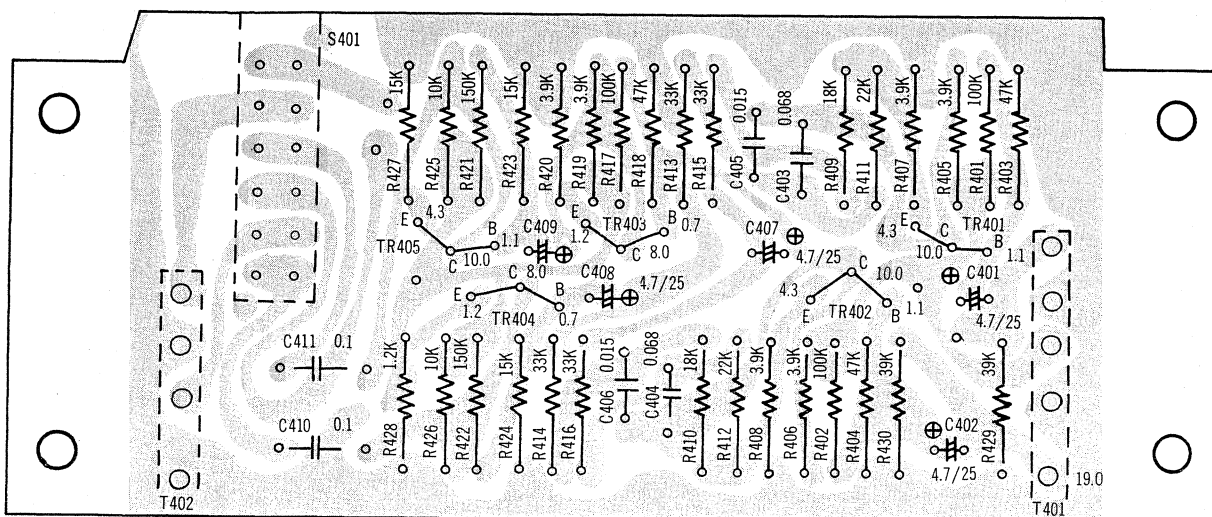
2-1, 5 Chome Ginza, Chuo-ku, Tokyo, Japan.

UNIT PARTS LOCATION

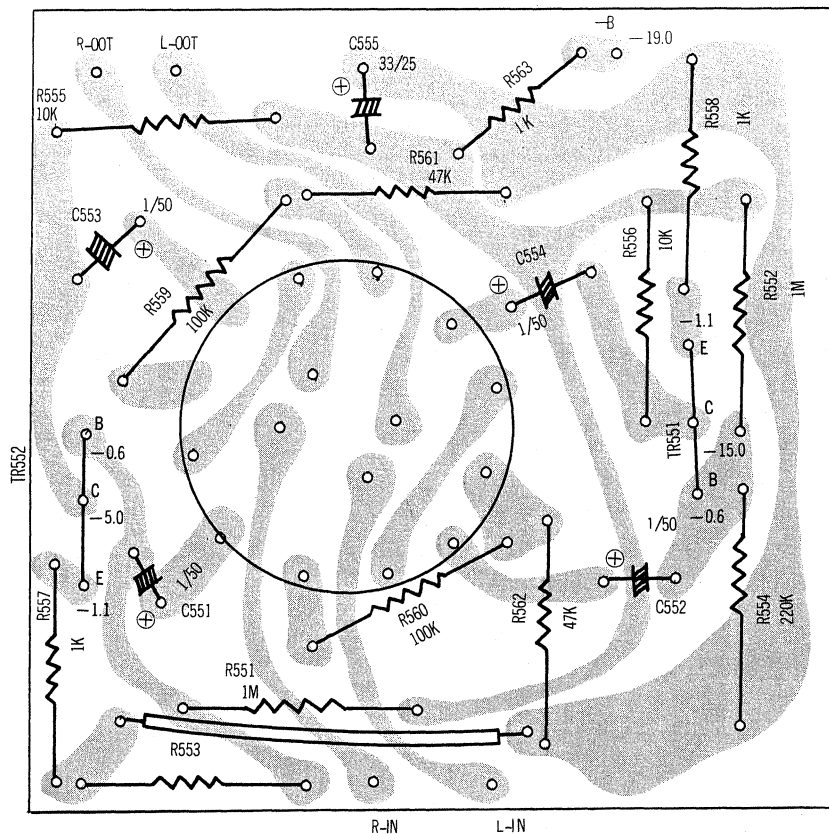
DIFFERENTIAL AMPLIFIER UNIT AF-63 (22136217)



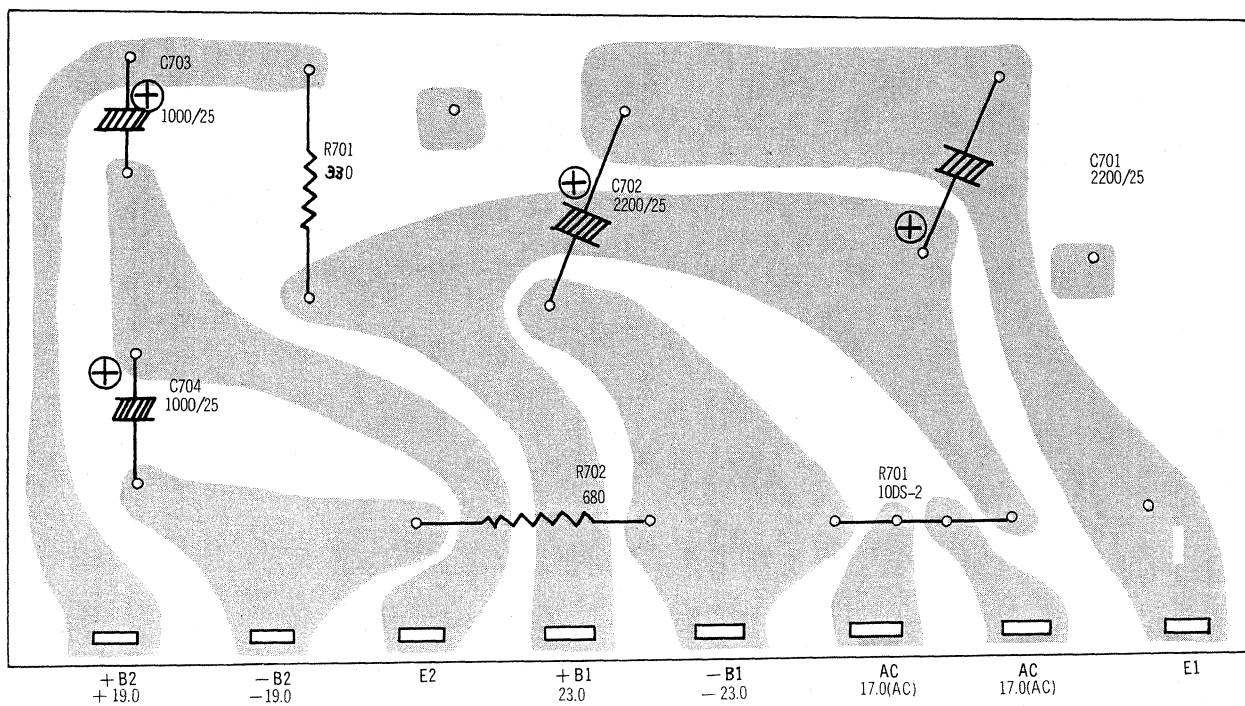
SQ UNIT AF 69 (22136228)



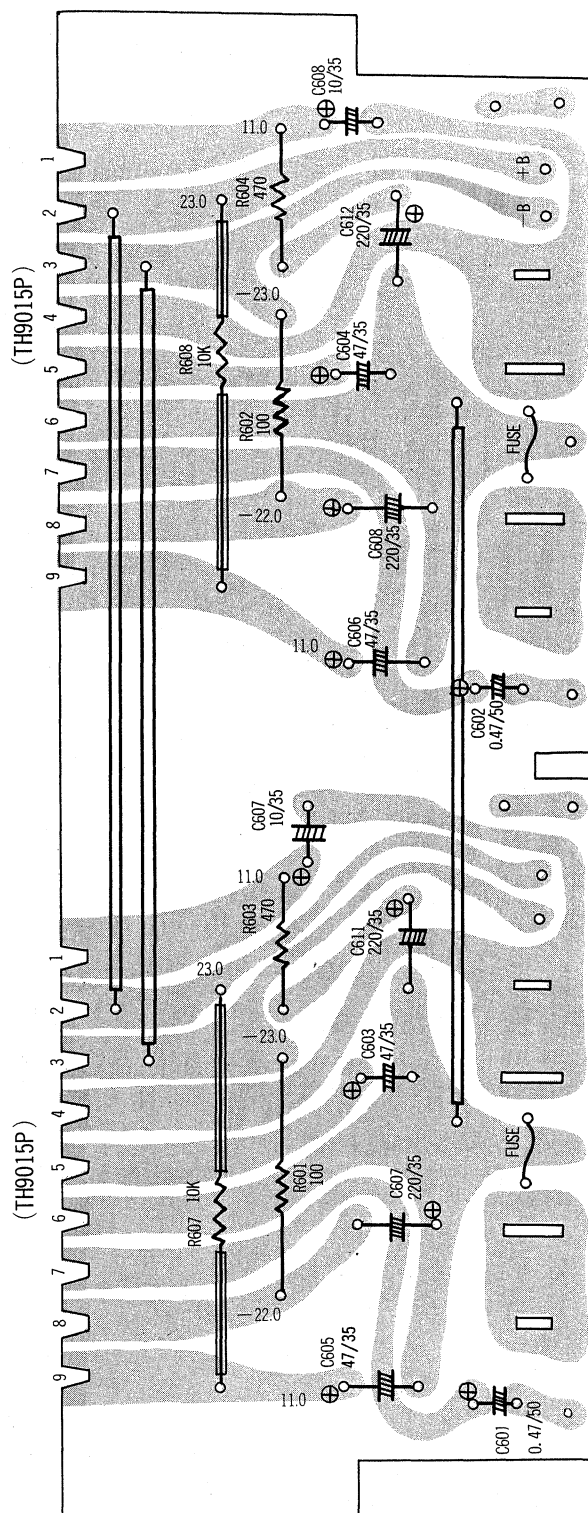
HEAD AMPLIFIER UNIT AF 70 (22136229)



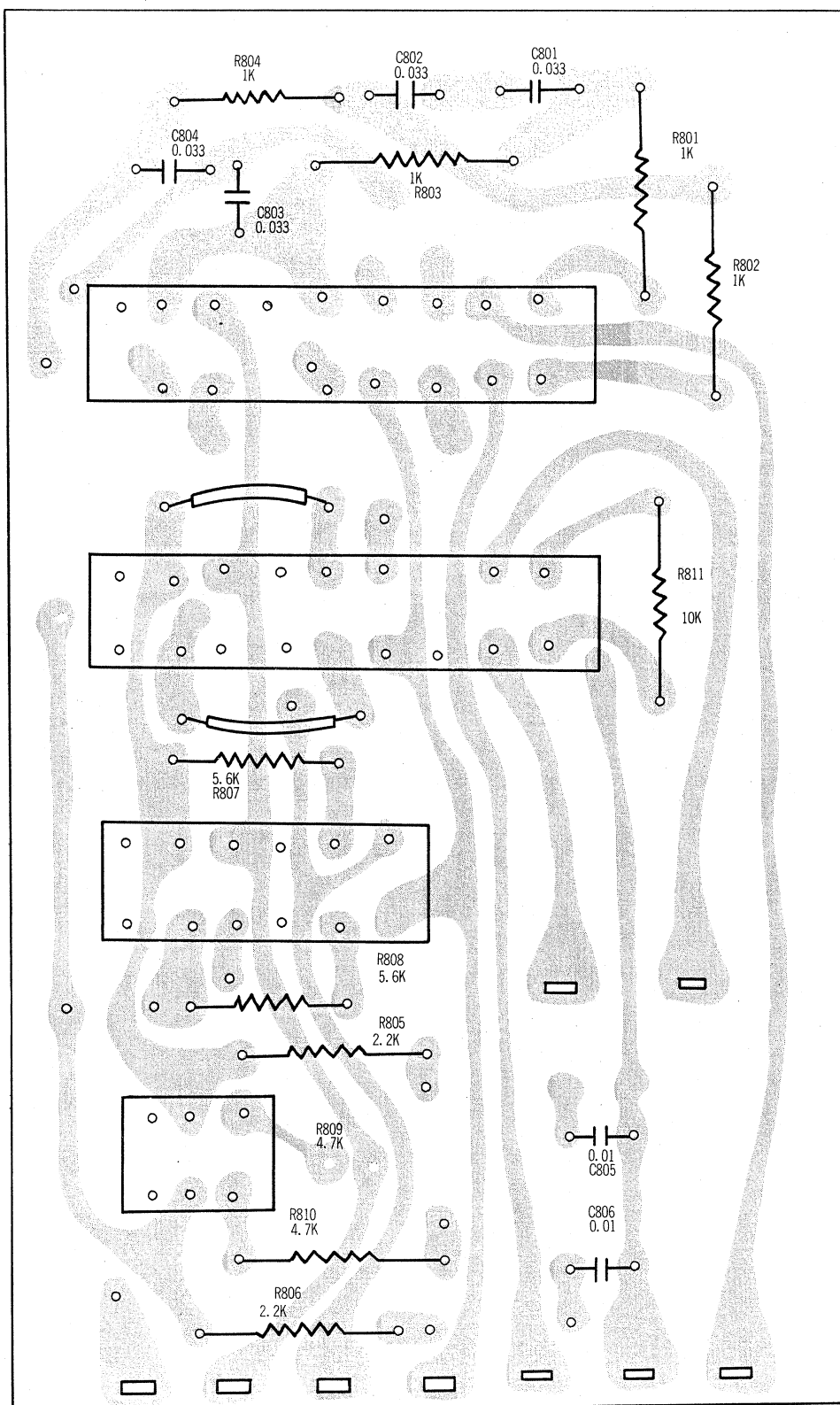
POWER SUPPLY UNIT SPLY - 13 (22138056)



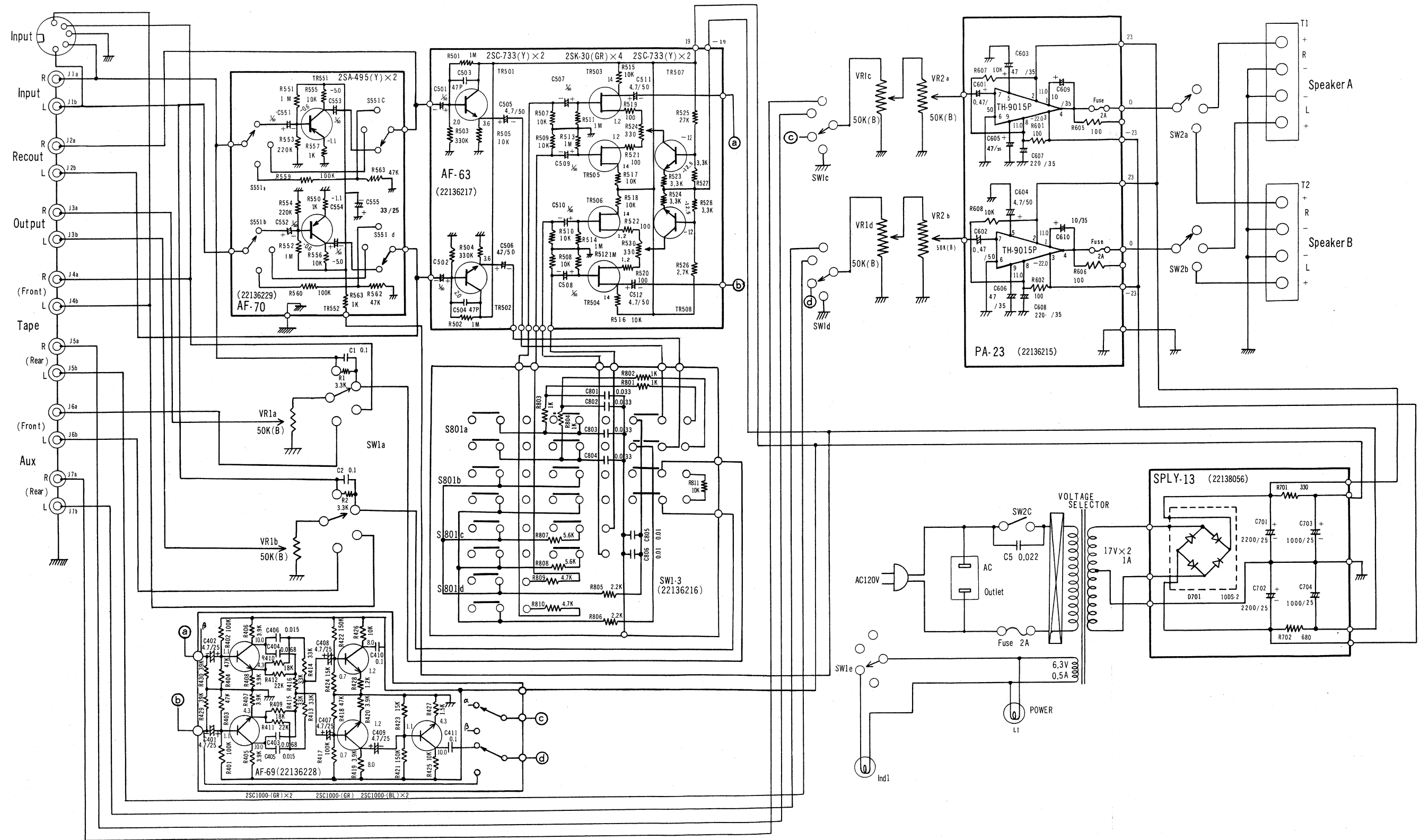
POWER AMPLIFIER UNIT PA-23 (22136215)



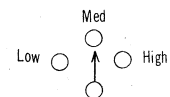
MATRIX EFFECT SWITCH UNIT SWI-3 (22136216)



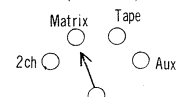
SCHEMATIC DIAGRAM



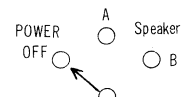
※ SW551 Action
(Input Level)



※ SW1 Action
(Channel)



※ SW2 Action
(Power Speaker Select)



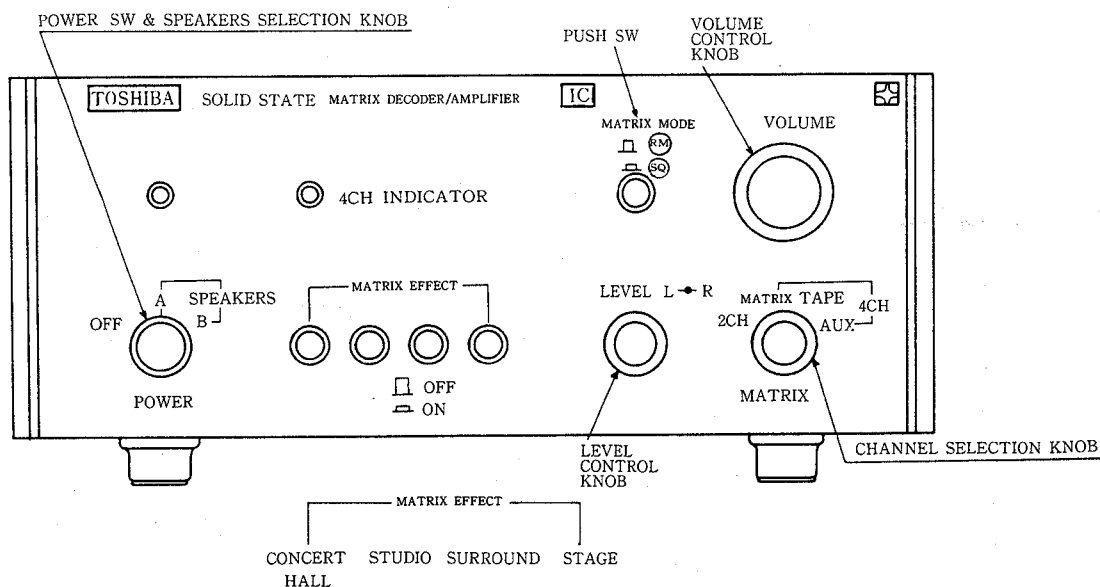


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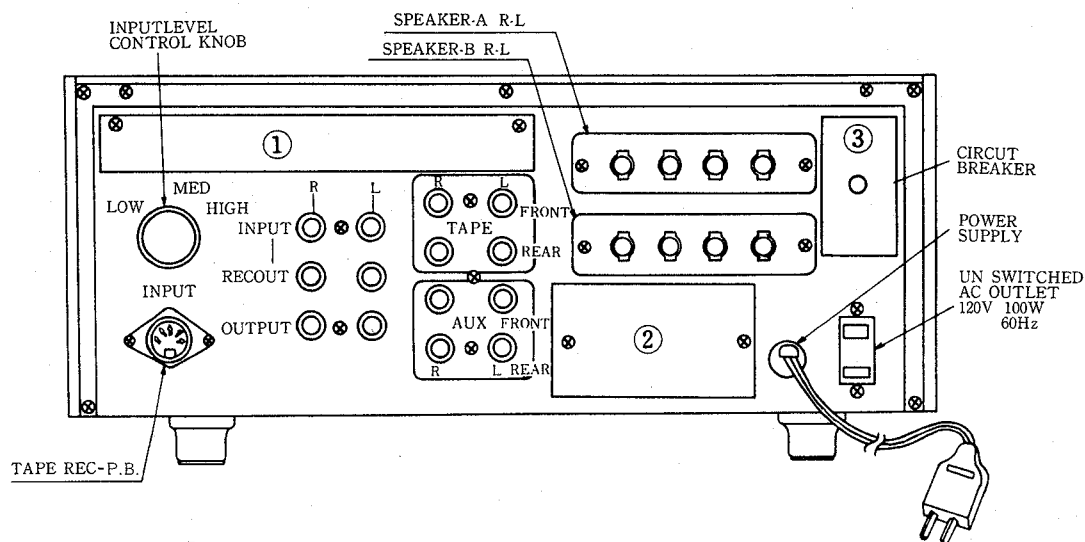
PARTS LOCATION	2
TECHNICAL POINTS (FEATURES)	4
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CABINET REMOVAL	
FRONT PANEL REMOVAL	
UNIT PARTS LOCATION	6
SCHEMATIC DIAGRAM	10
PARTS LIST	11

PARTS LOCATION

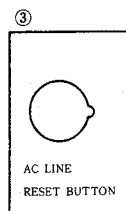
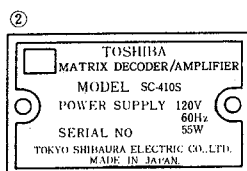
FRONT VIEW



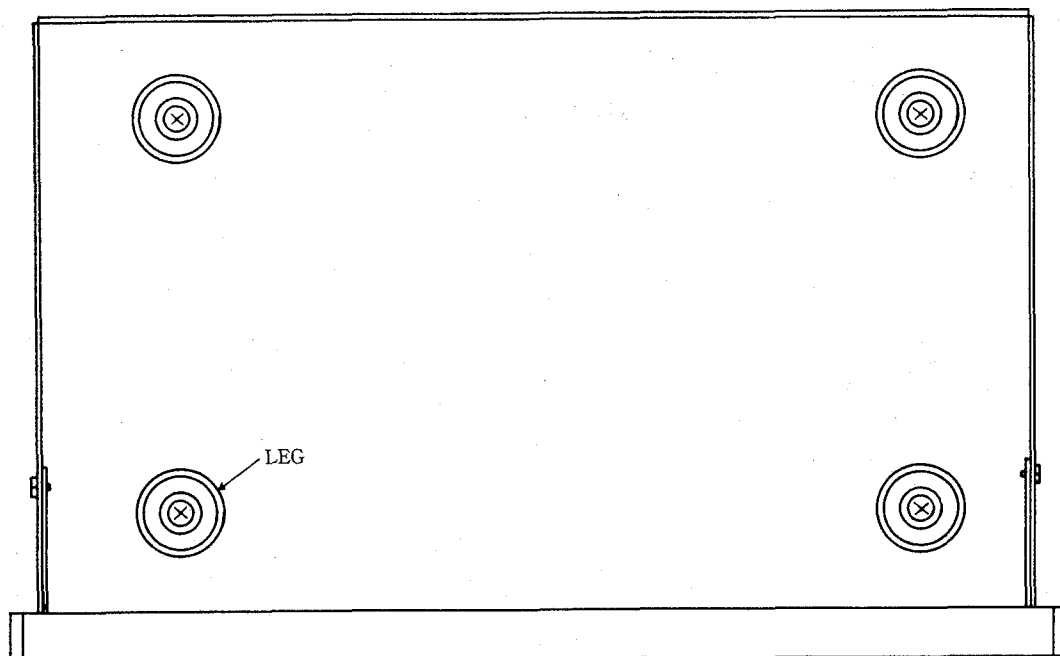
BACK VIEW



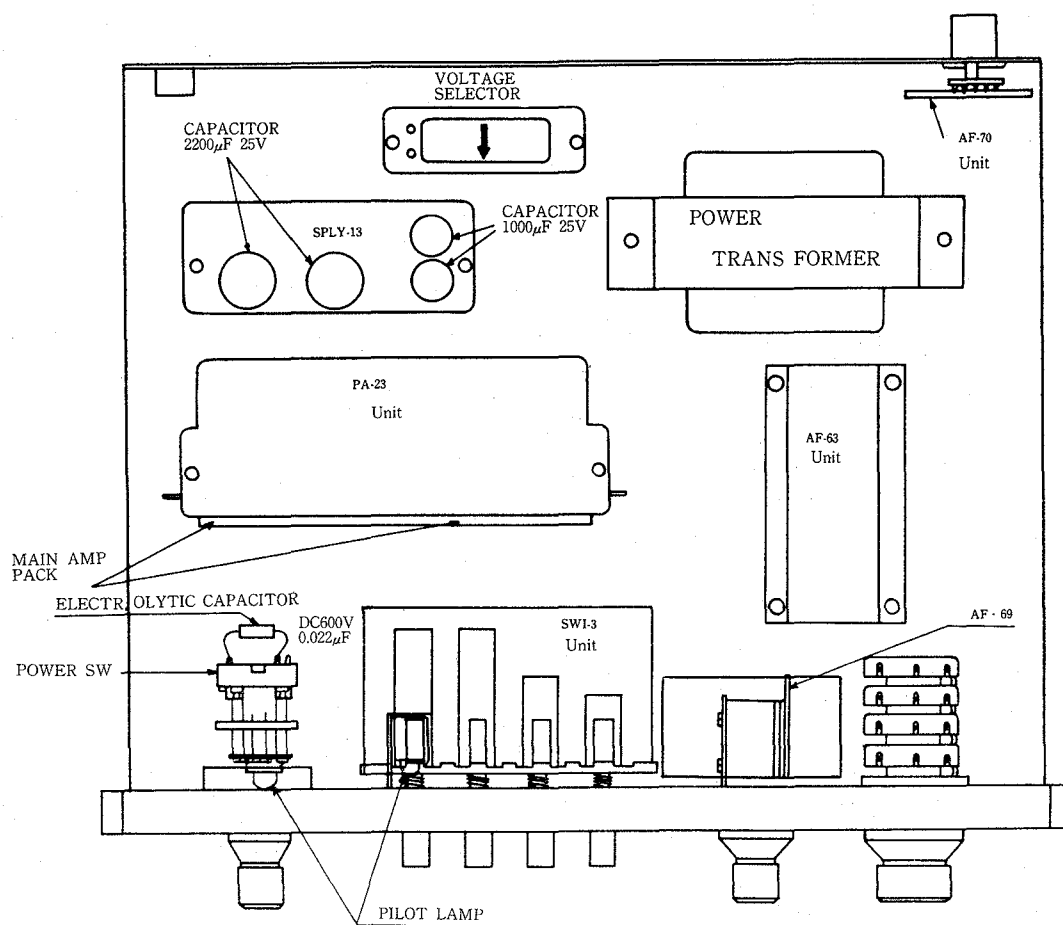
①
CAUTION TO PREVENT ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



BOTTOM VIEW



TOP VIEW



TECHNICAL POINTS

(FEATURES)

1. MATRIX DECODER produces 4-channel signal from conventional stereo source as well as from encoded 4-channel discs. (which are marketed by TOSHIBA in Japan)
2. Easy connection with any type of conventional stereo system, using pin-plug cord or DIN cord.
Input signal level can be selected by input level selector.
The transistors of head-amplifier are low noise PNP type.
3. Rear signals are separated by dual differential linear amplifier.

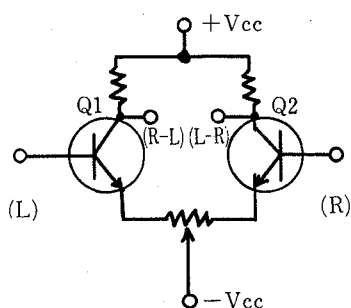


fig 1 basic circuit
of differential amplifier

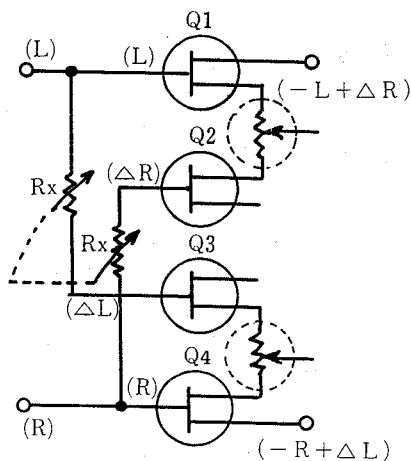


fig 2 the circuit of
dual differential
amplifier

Fig 1 on the left is basic circuit of differential amplifier. If the input signals (R), (L) are feeded to the base of transistor Q_1 and Q_2 , the output signals from collectors are differential part, that is, (R-L) and (L-R).

Fig 2 is the circuit of dual differential amplifier which is used in our MATRIX DECODER.

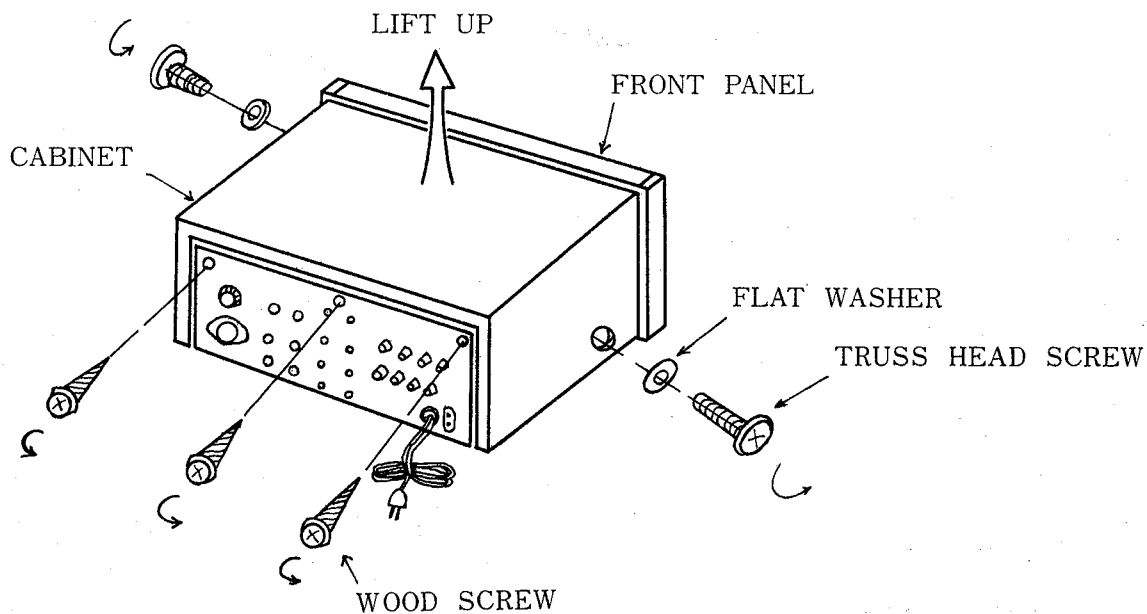
The input signals feeded to the transistors Q_1 , Q_2 , Q_3 and Q_4 are (L), (R) and (ΔL) , (ΔR) , the small signals (ΔL) , (ΔR) are controlled by volume R_x .

The dual differential amplifier makes different effects of matrix sound by changing the blend level of rear signals.

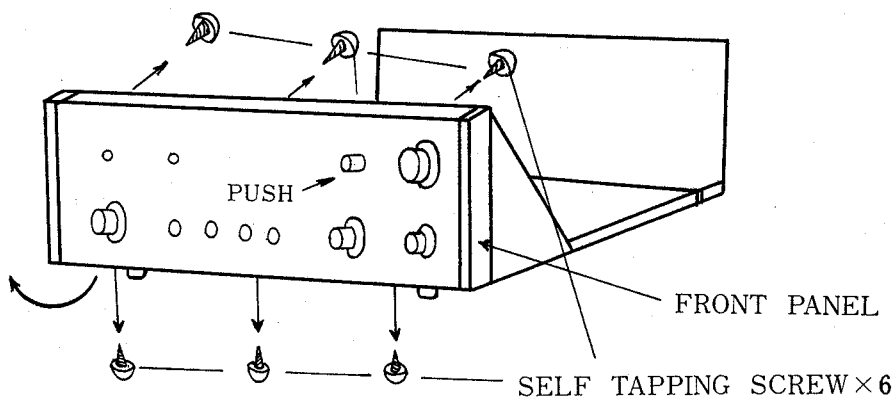
In practice, the value of R_x is changed by switch as 4 position.

SERVICE POINS

CABINET REMOVAT



FRONT PANEL REMOVAL



※ When removing the front panel, make the push button of Matrix Mode switch "SQ" position.

PARTS LIST

Key Ho.	Part No.	Description	Qty/set
IC, TRANSISTORS AND DIODS			
TR551, 552		Transistor, 2SA495-Y	2
TR503, 504, 505, 506		Transistor, 2SK30-GR	4
TR501, 502, 507, 508		Transistor, 2SC733-Y	4
TR401, 402, 403		Transistor, 2SC1000-GR	3
TR404, 405		Transistor, 2SC1000-BL	2
IC601, 602		IC TH9015P-JA	2
D701		Diod 10DS-2	1
TRANSFORMER			
PT1	22213419	Transformer, PT-7007	1
CAPACITORS			
C401, 402, 407, 408, C409	22446479	Electrolytic, 4.7mfd 25WV	5
C551, 552, 501, 502, C507, 508, 509, 510, C553, 554	22448109	Electrolytic, 1mfd 50WV	10
C601, 602	22448478	Electrolytic, 0.47mfd 50WV	4
C505, 506, 511, 512	22448479	Electrolytic, 4.7mfd 50WV	4
C555	22446330	Electrolytic, 33mfd 25WV	1
C701, 702	22434222	Electrolytic, 2200mfd 25WV	2
C703, 704	22446102	Electrolytic, 1000mfd 25WV	2
C603, 604, 605, 606	22447470	Electrolytic, 47mfd 35WV	4
C607, 608, 611, 612	22447221	Electrolytic, 220mfd 35WV	4
C609, 610	22447100	Electrolytic, 10mfd 35WV	2
C503, 504	22362470	Ceramic, 47pF 50WV	2
C513, 514	22373412	Mylar, 0.0047mfd 50WV	2
C805, 806	22373103	Mylar, 0.01mfd 50WV	2
C801, 802, 803, 804	22373333	Mylar, 0.033mfd 50WV	4
C405, 406	22373153	Mylar, 0.015mfd 50WV	2
C1, 2, 410, 411	22373104	Mylar, 0.1mfd 50WV	4
C403, 404	22373683	Mylar, 0.068mfd 50WV	2
C5	22310015	Polystyrene, 0.01mfd 250V AC	1
RESISTORS			
R519, 520, 521, 522	22546101	Carbon Film, 100ohm $\frac{1}{4}$ WK	6
R601, 602			
R603, 604	22546471	Carbon Film, 470ohm $\frac{1}{4}$ WK	2
R550, 557, 563, 801	22546102	Carbon Film, 1Kohm $\frac{1}{4}$ WK	7
R802, 803, 804			
R805, 806, 557, 558	22546222	Carbon Film, 2.2Kohm $\frac{1}{4}$ WK	4
R1, 2, 523, 524, 527, R528	22546332	Carbon Film, 3.3Kohm $\frac{1}{4}$ WK	6
R809, 810	22546472	Carbon Film, 4.7Kohm $\frac{1}{4}$ WV	2
R807, 808	22546562	Carbon Film, 5.6Kohm $\frac{1}{4}$ WK	2

Key No.	Part No.	Description	Qty/set
R555, 556, 505, 506, R507, 508, 509, 510, R515, 516, 517, 518, R811, 607, 608, 425, R426	22546103	Carbon Film, 10Kohm $\frac{1}{4}$ WK	17
R525, 526	22546273	Carbon Film, 27Kohm $\frac{1}{4}$ WK	2
R812, 813, 413, 414, R415, 416	22546333	Carbon Film, 33Kohm $\frac{1}{4}$ WK	6
R562, 563, 403, 404, R418	22546473	Carbon Film, 47Kohm $\frac{1}{4}$ WK	5
R559, 560, 401, 402	22546104	Carbon Film, 100Kohm, $\frac{1}{4}$ WK	4
R553, 554	22546224	Carbon Film, 220Kohm $\frac{1}{4}$ WK	2
R503, 504	22546334	Carbon Film, 330Kohm $\frac{1}{4}$ WK	2
R551, 552, 501, 502, R511, 512, 513, 514, R405, 406, 407, 408, R419, 420	22546105	Carbon Film, 1Mohm $\frac{1}{4}$ WK	8
R409, 410	22546392	Carbon Film, 3.9Kohm $\frac{1}{4}$ WK	6
R411, R412	22546183	Carbon Film, 18Kohm $\frac{1}{4}$ WK	2
R421, 422	22546223	Carbon Film, 22Kohm $\frac{1}{4}$ WK	2
R423, 424	22546154	Carbon Film, 150Kohm $\frac{1}{4}$ WK	2
R427	22546153	Carbon Film, 15Kohm $\frac{1}{4}$ WK	2
R429, 430	22546152	Carbon Film, 1.5Kohm $\frac{1}{4}$ WK	1
R701	22546393	Carbon Film, 3.9Kohm $\frac{1}{4}$ WK	2
R702	22563681	Solid, 680ohm $\frac{1}{2}$ WK	1
R524, 530	22563331	Solid, 330ohm $\frac{1}{2}$ WK	1
VR2	22658152	Semifixed Variable Resistor, 330ohm	2
VR1	22655021	Variable Resistor, 50Kohm (B)	1
	22650020	Variable Resistor, 50Kohm (B)	1
ELECTRICAL PARTS			
T1, 2	22162131	4P Screw Terminal, Speaker	2
S551	22146014	Rotary Switch, Input Level	1
S801	22146005	Push Switch, Matrix Effect	1
	22144182	Fuse 125V 2A, Circuit Protector	2
SW2	22146020	Rotary Switch, Power & Speaker	1
SW1	22146004	Rotary Switch, Channel	1
J4, 5, 6, 7	22163214	8P Pin Jack	1
J1, 2	22163330	6P Pin Jack	1
S901	22146006	Push Switch, Matrix Mode	1
	22167131	5P Socket, DIN type	1
	22167318	Voltage change Socket	1
	22116066	Wedge Base Socket	2
L1, IND1	22113150	Wedge Base Lamp	2
	22176221	AC Plugcord, EP type	1
	22167138	AC Socket	1
FI	22148150	Circuit Breaker	1

Key No.	Part No.	Description	Qty/set
UNITS			
	22136229	AF-70Unit, Head Amp Unit	1
	22138056	SPLY-13 Unit, Power Supply Unit	1
	22136217	AF-63 Unit, Differential Amp Unit	1
	22136216	SWI-3 Unit, Matrixeffect Switch Unit	1
	22136215	PA-23 Unit, Power Amp Unit	1
	22136228	AF-69 Unit, SQ Effect Amp Unit	1
MECHANICAL PARTS			
	20816186	Cabinet	1
	20003011	Front Panel Assy	1
	20831071	Decoration Frame	2
	20039020	Rubber Tube, Lamp Cover	2
	20871145	Knob, Input Level	1
	20871130	Knob, Volume	1
	20871144	Knob, Level Inner	1
	20871164	Knob, Level Outer	1
	20871162	Knob, Power & Channel	2
	20965004	Velt, Power Cord	1
	20021170	Cord Bushing, Power Cord	1
	20877056	Name Plate	1
	20857024	Indicator, Red	1
	20857025	Indicator, Green	1
	20773106	Bush, SQ Effect	1
	20956053	Label, Voltage Selector	1
	20021180	Bush, Matrix Efect	1
	20842029	Leg	4
	22021204	Bracket, Power Cord	1
	20968028	Caution Label	1
	20968029	Caution label, Fuse	1
	20794038	Screw, AC Outlet Socket	1
	20021300	Bracket, SQ Unit	1
	20021301	Bracket, SQ Unit	1
	7046401214	Truss Head Screw 4×12mm	2
	7400104011	Flat Washer 4mm	2
ACCESSORIES			
	20951150	Instruction Book	1
	22164291	Plug	2